

REMARKS

The claims have been amended to more clearly define the invention as disclosed in the written description. In particular, claim 3 has been cancelled, while claims 1, 11, 13 and 15 have been amended to include the limitations of cancelled claim 3. In addition, the claims have been amended for clarity.

Applicants believe that the above changes answer the Examiner's objection to claim 6 and respectfully request withdrawal thereof.

The Examiner has rejected claims 1-5, 8-10 and 13 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,288,767 to Murata et al. The Examiner has further rejected the claims (presumably 1-10 and 13) under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,014,197 to Hikmet. In addition, the Examiner has rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Murata et al. in view of U.S. Patent 6,095,203 to Yamamoto et al. Furthermore, the Examiner has rejected claims 11, 12 and 15 under 35 U.S.C. 103(a) as being unpatentable over Murata et al. in view of U.S. Patent 6,370,093 to Tada et al.

The Murata et al. patent discloses an imaging optical system in which a liquid crystal 31 includes nematic liquid crystal layers 52 and 53 with a biconcave lens structure therebetween, an optical axis passing through the layers, in which the second birefringent layer has molecules movable between a first and a second orientation relative the optical axis, and a refractive index dependent on the orientation of the molecules.

The Murata et al. system is indeed similar to the subject invention. However, in the subject invention, as claimed in claim 1, "the first birefringent layer has an ordinary axis substantially perpendicular to the optical axis and an extraordinary axis substantially perpendicular to the optical axis".

In the current Office Action, the Examiner states "Murata et al. teaches the first birefringent layer has an ordinary axis and an extraordinary axis substantially perpendicular to the optical axis (see Fig. 3)."

Applicants submit that the Examiner is mistaken. In particular, Fig. 3 neither shows nor suggests that either of the birefringent layers has both an ordinary axis and an extraordinary axis, and that both of these axes are substantially perpendicular to the optical axis. Further, Murata et al. describes Figs. 3 and 4 at col. 14, lines 19-59, and there is no mention of "ordinary axis" or "extraordinary axis", let alone that these axes appear in one of the birefringent layers and are substantially perpendicular to the optical axis.

The Hikmet patent discloses an electro-optical device wherein orientation layers have grating structure and comprises birefringent material with refractive indices equal to electro-optic medium, in which orientation (or alignment) layers 7 and 8 on opposing sides of a nematic liquid crystal material, are composed of a birefringent material.

Applicants submit that Hikmet neither shows nor suggests "a shaped interface structure arranged between and connecting the first and second birefringent layers".

The Examiner has indicated that Hikmet discloses "A first birefringent layer (7) connected to a second birefringent layer (2) by a shaped interface (41)."

Applicants believe that the Examiner is mistaken. In particular, the layer 7 is actually an orientation (or alignment) layer and as such, is directly in contact with the layer 2, i.e., there is no interface structure between layer 7 and 2. The surface 41 referred to by the Examiner appears in Figs. 12 and 13 and is a reflector for light radiating from a light source 40. As such, reflector 41 has nothing to do with layers 7 and 2.

Applicants also submit that Hikmet neither shows nor suggests "the first birefringent layer has an ordinary axis substantially perpendicular to the optical axis and an extraordinary axis substantially perpendicular to the optical axis".

The Examiner has indicated "Hikmet teaches that the first birefringent layer has an ordinary axis and an extraordinary axis substantially perpendicular to the optical axis (col. 4, line 66 - col. 5, line 4)."

Applicants believe that the Examiner is mistaken. In particular, the section of Hikmet noted by the Examiner states:

"At a voltage $V=0$ at the electrode layers 5, 6, shown in Fig. 1a, the molecules in the layer 7 and the medium 2 are oriented in such a way that at the interface of

the layer 7 and the medium 2 does not occur a change in refractive indices for the extraordinary and the ordinary component of the incident beam 11."

It should be apparent that Hikmet is describing the relationship between the molecules in the alignment layer 7 and the liquid crystal material 2 as opposed to the orientation of the molecules relative to the optical axis. Further, while the terms "ordinary" and "extraordinary" are used, this is in reference to components of the incident beam 11 as opposed to the layer 7 having "an ordinary axis substantially perpendicular to the optical axis and an extraordinary axis substantially perpendicular to the optical axis".

Claim 14 recites "...the second birefringent layer is provided by capillary cell filling".

The Examiner has indicated "Yamamoto et al. discloses a method of filling liquid crystal cells including capillary forces that enables injecting liquid crystal uniformly without generating bubbles (col. 5, lines 1-3)."

The Yamamoto et al. patent discloses a method and apparatus for injecting liquid crystal material, which includes "Still furthermore, the pressure force from the liquid crystal injection port is utilized as well as the evacuation force from the evacuation port. Thus, it is possible, by adjusting these forces, to inject the liquid crystal material uniformly into the entire liquid crystal panel without generating bubbles therein."

Applicants submit that Yamamoto et al. neither discloses nor suggests "capillary cell filling". Furthermore, Applicants

submit that Yamamoto et al. does not supply that which is missing from Murata et al., i.e., "the first birefringent layer has an ordinary axis substantially perpendicular to the optical axis and an extraordinary axis substantially perpendicular to the optical axis".

The Tada et al. patent discloses an optical disc device, which includes an optical scanning device for scanning an information layer comprising a radiation source and an objective system for converging radiation on the information layer.

However, Applicants submit that Tada et al. does not supply that which is missing from Murata et al., i.e., "the first birefringent layer has an ordinary axis substantially perpendicular to the optical axis and an extraordinary axis substantially perpendicular to the optical axis".

In view of the above, Applicants believe that the subject invention, as claimed, is neither anticipated nor rendered obvious by the prior art, either individually or collectively, and as such, is patentable thereover.

Applicants believe that this application, containing claims 1, 2 and 4-15, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

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